E 3510-22-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648-XB799]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Ferry Berth Improvements in Tongass Narrows in Ketchikan, Alaska

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; issuance of an incidental harassment authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that NMFS has issued an incidental harassment authorization (IHA) to the Alaska Department of Transportation and Public Facilities (ADOT) to incidentally harass, by Level A harassment and Level B harassment only, marine mammals during construction activities associated with construction of four ferry berth facilities in Tongass Narrows in Ketchikan, Alaska.

DATES: This Authorization is effective from March 5, 2022 through March 4, 2023.

FOR FURTHER INFORMATION CONTACT: Leah Davis, Office of Protected Resources, NMFS, (301) 427-8401. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act*. In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

The MMPA prohibits the "take" of marine mammals, with certain exceptions. sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq*.) direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed incidental take authorization may be provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other "means of effecting the least practicable adverse impact" on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for taking for certain subsistence uses (referred to in shorthand as "mitigation"); and requirements pertaining to the mitigation, monitoring and reporting of the takings are set forth. The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

Summary of Request

On August 19, 2021, NMFS received a request from the ADOT for an IHA to take marine mammals incidental to the construction of two ferry berth facilities in Tongass Narrows in Ketchikan, Alaska: the Gravina Airport Ferry Layup Facility and the Gravina Freight Facility. On December 17, 2021 we received a revised request that included additional work components associated with the Revilla New Ferry Berth and Upland Improvements and the New Gravina Island Shuttle Ferry Berth and Related

Terminal Improvements in the same region. The application was deemed adequate and complete on January 4, 2022. ADOT's request is for take of a small number of eight species of marine mammals, by Level B harassment and Level A harassment. Of those eight species, five (Steller sea lion (*Eumetopias jubatus*), harbor seal (*Phoca vitulina richardii*), harbor porpoise (*Phocoena phocoena*), Dall's porpoise (*Phocoenoides dalli*) and minke whale (*Balaenoptera acutorostrata*)) may also be taken by Level A harassment. Neither ADOT nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

NMFS previously issued two consecutive IHAs and a Renewal IHA to ADOT for this work (85 FR 673, January 7, 2020; 86 FR 23938, May 05, 2021). ADOT complied with all the requirements (*e.g.*, mitigation, monitoring, and reporting) of the previous IHAs and information regarding their monitoring results may be found in the **Description of Marine Mammals in the Area of Specified Activities** and **Marine Mammal Occurrence and Take Calculation and Estimation** sections. An IHA for the first phase of construction of the Ketchikan-Gravina Access Project was issued to ADOT on December 20, 2019 (85 FR 673, January 7, 2020). Complete construction of two of those components, the Revilla New Ferry Berth and Upland Improvements and Gravina Island Shuttle Ferry Berth Facility/Related Terminal Improvements, did not occur within the timeframe authorized by the Phase 1 IHA and will not be finished before the expiration of the subsequent one-year renewal (86 FR 23938, May 05, 2021). Therefore, ADOT requested a new IHA for incidental take associated with the continued marine construction of these facilities.

Description of the Specified Activity

ADOT is making improvements to existing ferry berths and constructing new ferry berths on Gravina Island and Revillagigedo (Revilla) Island in Tongass Narrows, near Ketchikan in southeast Alaska (Figure 1 of proposed IHA; 87 FR 5980; February 2,

2022). These ferry facilities provide the only public access between the city of Ketchikan, AK on Revilla Island, and the Ketchikan International Airport on Gravina Island. The project's planned activities that have the potential to take marine mammals, by Level A harassment and Level B harassment, include vibratory and impact pile driving, down-the-hole (DTH) operations for pile installation (rock socketing of piles and tension anchors to secure piles), and vibratory pile removal. The marine construction associated with the activities is planned to occur over 91 non-consecutive days over one year beginning March 2022.

A detailed description of the planned construction project is provided in the **Federal Register** notice for the proposed IHA (87 FR 5980; February 2, 2022). Since that time, no changes have been made to the planned activities. Therefore, a detailed description is not provided here. Please refer to that **Federal Register** notice for the description of the specific activity.

Comments and Responses

A notice of NMFS' proposal to issue an IHA to ADOT was published in the **Federal Register** on February 2, 2022 (87 FR 5980). That notice described, in detail, ADOT's activity, the marine mammal species that may be affected by the activity, and the anticipated effects on marine mammals. During the 30-day public comment period, NMFS did not receive any public comments.

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history, of the potentially affected species. Additional information regarding population trends and threats may be found in NMFS' Stock Assessment Reports (SARs; *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*) and more general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS' website (*https://www.fisheries.noaa.gov/find-species)*.

Table 1 lists all species or stocks for which take is expected and proposed to be authorized for this specified activity, and summarizes information related to the population or stock, including regulatory status under the MMPA and Endangered Species Act (ESA) and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2021). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS' SARs). While no mortality is anticipated or authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS' stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS' U.S. Alaska SARs (*e.g.*, Muto *et al.* 2021). All values presented in Table 1 are the most recent available at the time of publication and are available in the draft 2021 SARs (Muto *et al.* 2021; available online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/draft-marine-mammal-stock-assessment-reports*).

Table 1—Marine Mammal Species or Stocks for Which Take is Expected and Authorized

Common name	Scientific name	MMPA Stock	ESA/MMPA status; Strategic (Y/N)[1]	Stock abundance Nbest, (CV; N_{min}; most recent abundance survey)[2]	PBR	Annual M/SI[3]
Order Cetartiodactyla – Cetacea – Superfamily Mysticeti (baleen whales)						
Family Balaenidae						
Humpback whale	*Megaptera novaeangliae*	Central North Pacific	E, D,Y	10,103 (0.3; 7,890; 2006)	83	26
Minke whale	*Balaenoptera acutorostrata*	Alaska	-, N	N.A.(See SAR; N.A.; see SAR)	UND	0
Order Cetartiodactyla – Cetacea – Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Killer whale	*Orcinus orca*	Alaska Resident	-, N	2,347 (N.A.; 2,347; 2012)	24	1
		West Coast Transient	-, N	349 (N.A, 349; 2018)	3.5	0.4
		Northern Resident	-, N	302 (N.A.; 302; 2018	2.2	0.2

Pacific white-sided dolphin	*Lagenorhynchus obliquidens*	North Pacific	-,-; N	26,880 (N.A.; N.A.; 1990)	UND	0
Family Phocoenidae						
Harbor porpoise	*Phocoena phocoena*	Southeast Alaska	-, Y	See SAR (see SAR; see SAR; 2012)	See SAR	34
Dall's porpoise	*Phocoenoides dalli*	Alaska	-, N	See SAR (see SAR; see SAR; 2015)	See SAR	37
Order Carnivora – Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions)						
Steller sea lion	*Eumetopias jubatus*	Eastern U.S.	-,-, N	43,201 (see SAR; 43,201; 2017)	2,592	112
Family Phocidae (earless seals)						
Harbor seal	*Phoca vitulina richardii*	Clarence Strait	-, N	27,659 (See SAE; 24,854; 2015)	746	40

[1] - Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

[2]- NMFS marine mammal stock assessment reports online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*. CV is coefficient of variation; Nmin is the minimum estimate of stock abundance. In some cases, CV is not applicable (N.A.).

[3] - These values, found in NMFS' SARs, represent annual levels of human-caused mortality plus serious injury (M/SI) from all sources combined (*e.g.*, commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.

All species that could potentially occur in the project area are included in Table 3-1 of ADOT's IHA application. However, the spatial occurrence of gray whale and fin whale is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. Gray whales have not been reported by any local experts or recorded in monitoring reports and it would be extremely unlikely for a gray whale to enter Tongass Narrows or the small portions of Revillagigedo Channel this project will impact. Similarly for fin whale, sightings have not been reported and it would be unlikely for a fin whale to enter the project area as they are generally associated with deeper, more offshore waters. The eight species (with 10 managed stocks) in Table 1 temporally and

spatially co-occur with the activity to the degree that take is reasonably likely to occur, and we have authorized it.

A detailed description of the of the species likely to be affected by ADOT's project, including brief introductions to the species and relevant stocks as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in the **Federal Register** notice for the proposed IHA (87 FR 5980; February 2, 2022); since that time, we are not aware of any changes in the status of these species and stocks; therefore, detailed descriptions are not provided here. Please refer to that **Federal Register** notice for these descriptions. Please also refer to NMFS' website (*https://www.fisheries.noaa.gov/find-species*) for generalized species accounts.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (*e.g.*, Richardson *et al.* 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007) recommended that marine mammals be divided into functional hearing groups based on directly measured or estimated hearing ranges on the basis of available behavioral response data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e.*, low-frequency cetaceans). Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 decibel (dB) threshold from the normalized composite audiograms,

with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. Marine mammal hearing groups and their associated hearing ranges are provided in Table 2.

Table 2--Marine Mammal Hearing Groups (NMFS, 2018)

Hearing Group	Generalized Hearing Range*
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 35 kHz
Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz
High-frequency (HF) cetaceans (true porpoises, *Kogia*, river dolphins, cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*)	275 Hz to 160 kHz
Phocid pinnipeds (PW) (underwater) (true seals)	50 Hz to 86 kHz
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 39 kHz
* Represents the generalized hearing range for the entire group as a composite (*i.e.,* all species within the group), where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on ~65 dB threshold from normalized composite audiogram, with the exception for lower limits for LF cetaceans (Southall *et al.* 2007) and PW pinniped (approximation).	

The pinniped functional hearing group was modified from Southall *et al.* (2007) on the basis of data indicating that phocid species have consistently demonstrated an extended frequency range of hearing compared to otariids, especially in the higher frequency range (Hemilä *et al.* 2006; Kastelein *et al.* 2009; Reichmuth and Holt, 2013).

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information. Eight marine mammal species (six cetacean and two pinniped (one otariid and one phocid) species) have the reasonable potential to co-occur with the planned activities. Please refer to Table 1. Of the cetacean species that may be present, two are classified as low-frequency cetaceans (*i.e.*, all mysticete species), two are classified as mid-frequency cetaceans (*i.e.*, all delphinid and ziphiid species and the sperm whale), and two are classified as high-frequency cetaceans (*i.e.*, harbor porpoise, Dall's porpoise and *Kogia spp*.).

Potential Effects of Specified Activities on Marine Mammals and their Habitat

The effects of underwater noise from the ADOT's activities have the potential to result in take of marine mammals by Level B harassment and Level A harassment in the vicinity of the survey area. The notice of proposed IHA (87 FR 5980; February 2, 2022) included a discussion of the effects of anthropogenic noise on marine mammals and the potential effects of underwater noise from ADOT's construction activities on marine mammals and their habitat. That information and analysis is incorporated by reference into this final IHA and is not repeated here; please refer to the notice of the proposed IHA (87 FR 5980; February 2, 2022).

The **Estimated Take** section in this document includes a quantitative analysis of the number of individuals that are expected to be taken by this activity. The **Negligible Impact Analysis and Determination** section considers the content of this section, the **Estimated Take** section, and the **Mitigation Measures** section, to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and how those impacts on individuals are likely to impact marine mammal species or stocks. We also provided additional description of sound sources in our notice of proposed IHA (87 FR 5980; February 2, 2022).

Estimated Take

This section provides an estimate of the number of incidental takes authorized through this IHA, which will inform both NMFS' consideration of "small numbers" and the negligible impact determination.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as any act of pursuit, torment, or annoyance, which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal

stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes will primarily be by Level B harassment, as use of the acoustic sources (*i.e.*, impact and vibratory pile driving and DTH) have the potential to result in disruption of behavioral patterns for individual marine mammals. There is also some potential for auditory injury (Level A harassment) to result, primarily for mysticetes, high frequency species and phocids because predicted auditory injury zones are larger than for mid-frequency species and otariids. Auditory injury is unlikely to occur to mid-frequency species and otariids. The required mitigation and monitoring measures are expected to minimize the severity of such taking to the extent practicable.

As described previously, no mortality is anticipated or authorized for this activity. Below we describe how the take is estimated.

Generally speaking, we estimate take by considering: (1) acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) and the number of days of activities. We note that while these basic factors can contribute to a basic calculation to provide an initial prediction of takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.,* previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the take estimate.

Acoustic Thresholds

NMFS recommends the use of acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably

expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment).

Level B Harassment for non-explosive sources – Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.*, frequency, predictability, duty cycle), the environment (*e.g.*, bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.* 2007, Ellison *et al.* 2012). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1 microPascal (μPa) (root mean square (rms)) for continuous (*e.g.,* vibratory pile-driving, DTH) and above 160 dB re 1 μPa (rms) for non-explosive impulsive (*e.g.*, seismic airguns) or intermittent (*e.g.*, scientific sonar) sources. This take estimation includes disruption of behavioral patterns resulting directly in response to noise exposure (*e.g.*, avoidance), as well as that resulting indirectly from associated impacts such as TTS or masking. ADOT's planned activity includes the use of continuous (vibratory pile driving/removal and DTH) and impulsive (impact pile driving and DTH) sources, and therefore both the 120 and 160 dB re 1 μPa (rms) thresholds are applicable.

Level A harassment for non-explosive sources - NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a

result of exposure to noise from two different types of sources (impulsive or non-impulsive). ADOT's planned activity includes the use of impulsive (impact pile driving and DTH) and non-impulsive (vibratory pile driving/removal and DTH) sources.

These thresholds are provided in Table 3 below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2018 Technical Guidance, which may be accessed at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance*.

Table 3-- Thresholds Identifying the Onset of Permanent Threshold Shift

	PTS Onset Acoustic Thresholds* (Received Level)	
Hearing Group	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	*Cell 1* $L_{pk,flat}$: 219 dB $L_{E,LF,24h}$: 183 dB	*Cell 2* $L_{E,LF,24h}$: 199 dB
Mid-Frequency (MF) Cetaceans	*Cell 3* $L_{pk,flat}$: 230 dB $L_{E,MF,24h}$: 185 dB	*Cell 4* $L_{E,MF,24h}$: 198 dB
High-Frequency (HF) Cetaceans	*Cell 5* $L_{pk,flat}$: 202 dB $L_{E,HF,24h}$: 155 dB	*Cell 6* $L_{E,HF,24h}$: 173 dB
Phocid Pinnipeds (PW) (Underwater)	*Cell 7* $L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	*Cell 8* $L_{E,PW,24h}$: 201 dB
Otariid Pinnipeds (OW) (Underwater)	*Cell 9* $L_{pk,flat}$: 232 dB $L_{E,OW,24h}$: 203 dB	*Cell 10* $L_{E,OW,24h}$: 219 dB

* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.

Note: Peak sound pressure (L_{pk}) has a reference value of 1 µPa, and cumulative sound exposure level (L_E) has a reference value of 1µPa^{2}s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (*i.e.*, varying

exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

Ensonified Area

Here, we describe operational and environmental parameters of the activity that will feed into identifying the area ensonified above the acoustic thresholds, which include source levels and transmission loss coefficient.

The sound field in the project area is the existing background noise plus additional construction noise from the project. Marine mammals are expected to be affected via sound generated by the primary components of the project (*i.e.*, impact pile driving, vibratory pile driving, vibratory pile removal, and DTH).

In order to calculate distances to the Level A harassment and Level B harassment sound thresholds for the methods and piles being used in this project, NMFS used acoustic monitoring data from other locations to develop source levels for the various pile types, sizes and methods (Table 4). Note that piles of differing sizes have different sound source levels (SSLs).

Empirical data from recent ADOT sound source verification (SSV) studies at Ketchikan were used to estimate SSLs for vibratory and impact driving of 30-inch steel pipe piles (Denes *et al.* 2016). Data from Ketchikan was used because of its proximity to this project in Tongass Narrows. However, the use of data from Alaska sites was not appropriate in all instances. Details are described below.

For vibratory driving of 24-inch steel piles, data from a Navy pile driving project in the Puget Sound, WA was reviewed (Navy 2015). From this review, ADOT

determined the Navy's suggested source value of 161 decibels (dB) root mean squared (rms) was an appropriate proxy source value, and NMFS concurs. Because the source value of smaller piles of the same general type (steel in this case) are not expected to exceed a larger pile, the same 161 dB rms source value was used for 20-inch steel piles. This assumption conforms with source values presented in Navy (2015) for a project using 16-inch steel piles at Naval Base Kitsap in Bangor, WA.

ADOT used source values of 177 dB sound exposure level (SEL) and 190 dB rms for impact driving of 24-inch and 20-inch steel piles. These values were determined based on summary values presented in Caltrans (2015) for impact driving of 24-inch steel piles. NMFS concurs that the same source value was an acceptable proxy for impact driving of 20-inch steel piles.

Sound pressure levels in the water column resulting from DTH are not well studied. Because DTH hole creation includes both impulsive and continuous components, NMFS guidance currently recommends that it be treated as a continuous sound for Level B calculations and as an impulsive sound for Level A calculations **(**Table 10). In the absence of data specific to different hole sizes, current NMFS guidance recommends that calculation of Level B zones for DTH use the same continuous SSL of 167 dB SEL for all hole sizes (Heyvaert and Reyff 2021). Recommended SSLs for 30-inch and 24-inch holes as well as 8-inch holes for tension anchors and micropiles for use in the calculation of Level A harassment thresholds are provided by current NMFS guidance and in Table 4.

Table 4-- Estimates of Mean Underwater Sound Levels Generated During Vibratory and Impact Pile Installation, DTH, and Vibratory Pile Removal

Method and pile type	SSL at 10 m	Literature source
Vibratory hammer	dB rms	
30-inch steel piles	162	Denes *et al.* 2016

24-inch steel piles	161			Navy 2015
20-inch steel piles	161			Navy 2015
DTH of rock sockets and tension anchors	dB rms			
All pile diameters	167			Heyvaert and Reyff 2021
DTH of rock sockets and tension anchors	dB SELss		dB peak	
30-inch rock socket	164		194	Reyff and Heyvaert 2019; Reyff 2020; Denes *et al.* 2016
24-inch rock socket	159		184	Heyvaert and Reyff 2021
8-inch tension anchor/ micropile	144		170	Reyff 2020
Impact Hammer	dB rms	dB SEL	dB peak	
30-inch steel piles	195	181	209	Denes *et al.* 2016
24-inch steel piles	190	177	203	Caltrans 2015
20-inch steel piles	190	177	202	Caltrans 2015

Note: It is assumed that noise levels during pile installation and removal are similar. SEL = sound exposure level; dB peak = peak sound level; rms = root mean square.

Simultaneous use of two impact, vibratory, or DTH hammers, or any combination of those equipment, could occur. Such occurrences are anticipated to be infrequent, will be for short durations on any given day, and ADOT anticipates that no more than two hammers will be operated concurrently. Simultaneous use of two hammers or DTH systems could occur at the same project site, or at two different, but nearby project sites. Simultaneous use of hammers could result in increased SPLs and harassment zone sizes given the proximity of the component driving sites and the physical rules of decibel addition. ADOT anticipates that concurrent use of two hammers producing continuous noise could occur on 44 days, which is half the anticipated number of days of construction (91 days) and represents complete overlap between the two contracts and/or represents use of two hammers by a single contractor. Although it is unlikely that overlap

will be complete, ADOT anticipates, and NMFS concurs, this scenario represents the potential worst case scenario, given that a more accurate estimate is not possible, and concurrent operation of hammers will be incidental. Given that the use of more than one hammer for pile installation on the same day (whether simultaneous or not) will increase the number of piles installed per day, this is anticipated to result in a reduction of the total number of days of pile installation. Table 5 shows how potential scenarios would reduce the total number of pile driving days and weeks. However, as described in the *Marine Mammal Occurrence and Take Calculation and Estimation* section below, ADOT has conservatively calculated take with the assumption that pile driving will occur on all 91 days.

Table 5-- Calculated Reduction of Pile Driving Days Based on Percentage of Project Days with Two Hammers in Use

Percent Overlap	Days of Overlap	Days of Work Completed During Overlap (2 Hammers)	Remaining Days of Work With Single Hammer	Total Number of Days of Work	Weeks of Work
0	0.0	0.0	91.0	91.0	15.2
10	9.1	18.2	72.8	81.9	13.7
20	18.2	36.4	54.6	72.8	12.1
30	27.3	54.6	36.4	63.7	10.6
40	36.4	72.8	18.2	54.6	9.1
50	45.5	91.0	0.0	45.5	7.6

NMFS (2018b) handles overlapping sound fields created by the use of more than one hammer differently for impulsive (impact hammer and Level A harassment zones for drilling with a DTH hammer) and continuous sound sources (vibratory hammer and Level B harassment zones for drilling with a DTH hammer; Table 6) and differently for impulsive sources with rapid impulse rates of multiple strikes per second (DTH) and slow impulse rates (impact hammering) (NMFS 2021). It is unlikely that the two impact hammers will strike at the same instant, and therefore, the SPLs will not be adjusted regardless of the distance between impact hammers. In this case, each impact hammer

will be considered to have its own independent Level A harassment and Level B harassment zones.

When two DTH hammers operate simultaneously their continuous sound components overlap completely in time. When the Level B isopleth of one DTH sound source encompasses the isopleth of another DTH sound source, the sources are considered additive and combined using the following rules (Table 7). The method described below was based on one created by Washington State Department of Transportation (WSDOT) and has been updated and modified by NMFS (WSDOT 2020). For addition of two simultaneous DTH hammers, the difference between the two SSLs is calculated, and if that difference is between 0 and 1 dB, 3 dB are added to the higher SSL; if difference is between 2 or 3 dB, 2 dB are added to the highest SSL; if the difference is between 4 to 9 dB, 1 dB is added to the highest SSL; and with differences of 10 or more decibels, there is no addition.

When two continuous noise sources, such as vibratory hammers, have overlapping sound fields, there is potential for higher sound levels than for non-overlapping sources.

When two or more vibratory hammers are used simultaneously, and the isopleth of one sound source encompasses the isopleth of another sound source, the sources are considered additive and source levels are combined using the rules in Table 6, similar to that described above for DTH.

Table 6-- Rules for Combining Sound Source Levels Generated During Pile Installation

Hammer Types	Difference in SSL	Level A Zones	Level B Zones
Vibratory, Impact	Any	Use impact zones	Use largest zone
Impact, Impact	Any	Use zones for each pile size and number of strikes	Use zone for each pile size

Vibratory, Vibratory or DTH, DTH	0 or 1 dB	Add 3 dB to the higher source level	Add 3 dB to the higher source level
	2 or 3 dB	Add 2 dB to the higher source level	Add 2 dB to the higher source level
	4 to 9 dB	Add 1 dB to the higher source level	Add 1 dB to the higher source level
	10 dB or more	Add 0 dB to the higher source level	Add 0 dB to the higher source level

During pile driving, it is common for pile installation to start and stop multiple times as each pile is adjusted and its progress is measured and documented, though as stated above, for short durations, it is anticipated that multiple hammers could be in use simultaneously. Following an approach modified from WSDOT in their Biological Assessment manual (WSDOT 2020) and described in Table 7, decibel addition calculations were carried out for possible combinations of pile driving and DTH throughout the project area. The source levels included in Table 7 are used to estimate the Level A harassment zones and the Level B harassment zones.

Table 7--Combined SSLs (dB at 10 m) Generated During Pile Installation and Removal for Combinations of Two Pieces of Equipment: Impact Hammer, Vibratory Hammer, and Down-the-Hole Drill

Method			Vibratory (RMS)			DTH (RMS)			DTH (SEL)		
	Pile Diameter		20	24	30	8	24	30	8	24	30
		SSL	161	161	162	167	167	167	144	159	164
Vibratory (RMS)	20	161	164	164	165	168	168	168			
	24	161	164	164	165	168	168	168			
	30	162	165	165	165	168	168	168			
DTH (RMS)	8	167	168	168	168	170	170	170			
	24	167	168	168	168	170	170	170			
	30	167	168	168	168	170	170	170			
DTH (SEL)	8	144							147	159	164
	24	159							159	162	165
	30	164							164	165	167

No addition is warranted for impact pile driving in combination with vibratory or impact pile driving or DTH (NMFS 2021).

Level B Harassment Zones

Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater TL is:

TL = B * Log10 (R1/R2),

Where:

TL = transmission loss in dB

B = transmission loss coefficient; for practical spreading equals 15

R1 = the distance of the modeled SPL from the driven pile, and

R2 = the distance from the driven pile of the initial measurement

The recommended TL coefficient for most nearshore environments is the practical spreading value of 15. This value results in an expected propagation environment that will lie between spherical and cylindrical spreading loss conditions, which is the most appropriate assumption for ADOT's planned activity in the absence of specific modelling.

All Level B harassment isopleths are reported in Table 8 and Table 9 below. It should be noted that based on the geography of Tongass Narrows and the surrounding islands, sound will not reach the full distance of the Level B harassment isopleth in most directions. Generally, due to interaction with land, only a thin slice of the possible area is ensonified to the full distance of the Level B harassment isopleth.

The size of the Level B harassment zone during concurrent operation of two vibratory or DTH hammers will depend on the combination of sound sources and the decibel addition of two hammers producing continuous noise. Table 8 shows the

distances to Level B harassment isopleths during simultaneous hammering from two sources, based on the combined SSL. Because the calculated Level B harassment isopleths for two sources are dependent upon the combined SSL, the Level B harassment zone for each combined sound source level included in Table 8 is consistent, regardless of the equipment combination. Please refer to Table 7 to determine which sound sources apply to each combined SSL.

As noted previously, pile installation often involves numerous stops and starts of the hammer for each pile. Therefore, decibel addition is applied only when the adjacent continuous sound sources experience overlapping sound fields, which generally requires close proximity of driving locations.

Table 8-- Level B Harassment Isopleths for Multiple Vibratory Hammer Additions

Combined SSL (dB)	Level B Harassment Isopleth (m)[a]
164	8,577
165	10,000
166	11,659
167	13,594
168	15,849
169	18,478
170	21,544

[a] These larger zones are truncated to the southeast by islands, which prevent propagation of sound in that direction beyond the confines of Tongass Narrows. To the northwest of Tongass Narrows, combined sound levels that exceed 167 dB rms extend into Clarence Strait before attenuating to sound levels that are anticipated to be below 120 dB rms.

Table 9-- Level B Harassment Isopleths for Single Hammer Use by Activity and Pile Size

Activity	Pile Diameter	Level B Harassment Isopleth (m)
Vibratory Installation	30-inch	6,310
	24-inch	5,412
	20-inch	
Vibratory Removal	24-inch	
DTH Rock Sockets	30-inch	13,594
	24-inch	
DTH Tension Anchor/ Micropile	8-inch	

Impact Installation	30-inch	2,154
	24-inch	1,000
	20-inch	1,000

Level A Harassment Zones

When the NMFS Technical Guidance (2016) was published, in recognition of the fact that ensonified area/volume could be more technically challenging to predict because of the duration component in the new thresholds, we developed a User Spreadsheet that includes tools to help predict a simple isopleth that can be used in conjunction with marine mammal density or occurrence to help predict takes. We note that because of some of the assumptions included in the methods used for these tools, we anticipate that isopleths produced are typically going to be overestimates of some degree, which may result in some degree of overestimate of takes by Level A harassment. However, these tools offer the best way to predict appropriate isopleths when more sophisticated 3D modeling methods are not available, and NMFS continues to develop ways to quantitatively refine these tools, and will qualitatively address the output where appropriate. For stationary sources such as pile driving or removal and DTH using any of the methods discussed above, NMFS' User Spreadsheet predicts the closest distance at which, if a marine mammal remained at that distance the whole duration of the activity, it will incur PTS. Inputs used in the User Spreadsheet are reported in Table 10 and Table 11, and the resulting isopleths are reported below in Table 12 and Table 13. Pile installation and removal can occur at variable rates, from a few minutes one day to many hours the next. ADOT anticipates that one permanent pile will be installed per day on 27 non-consecutive days, two temporary piles will be installed per day on 10 non-consecutive days, and two temporary piles will be removed per day on 10 days.

Table 10-- NMFS User Spreadsheet Inputs For Single Hammer Use

Equipment Type	Vibratory Pile Driver (Installation of 30-inch steel piles)	Vibratory Pile Driver (Installation and Removal of 24-inch steel piles)	Vibratory Pile Driver (Installation of 20-inch steel piles)	DTH Rock Sockets (30-inch)	DTH Rock Sockets (24-inch)	DTH Tension Anchor (8-inch)	Impact Pile Driver (30-inch steel piles)	Impact Pile Driver (24-inch steel piles)	Impact Pile Driver (20-inch steel piles)
Spreadsheet Tab Used	A.1) Vibratory Pile Driving	A.1) Vibratory Pile Driving	A.1) Vibratory Pile Driving	E.2) DTH Pile Driving	E.2) DTH Pile Driving	E.2) DTH Pile Driving	E.1) Impact Pile Driving	E.1) Impact Pile Driving	E.1) Impact Pile Driving
Weighting Factor Adjustment (kHz)	2.5	2.5	2.5	2	2	2	2	2	2
SSL	162[a]	161[a]	161[a]	164[b]	159[b]	144[b]	181[b]	177[b]	177[b]
Activity duration (hours) within 24 hours	1	1	1	1 – 10	1 – 10	2-4			
Number of piles per day	1	1	1	1	1	1	1	1	1
Strike rate strikes per second				15	15	25.83			
Number of strikes per pile							50	50	50

Notes: Propagation loss coefficient in all cases is 15. Duration estimates for DTH are based on assumption of multiple rock sockets and tension anchors being installed each day, with the maximum duration time for installation per day predicted to be 10 hours for rock socket DTH and 4 hours for tension anchor DTH. For specifics regarding the number of strikes and number of piles that will be used in a given situation, please refer to Table 1 in the notice of proposed IHA (87 FR 5980; February 2, 2022).

[a] dB rms at 10m

[b] dB SEL at 10m

Regarding implications for Level A harassment zones when two vibratory hammers are operating concurrently, given the small size of the estimated Level A harassment isopleths for all hearing groups during vibratory pile driving, the zones of any two hammers are not expected to overlap. Therefore, compounding effects of multiple vibratory hammers operating concurrently are not anticipated, and NMFS has treated each source independently.

Regarding implications for Level A harassment zones when one vibratory hammer and one DTH hammer are operating concurrently, combining isopleths for these sources is difficult for a variety of reasons. First, vibratory pile driving relies upon non-impulsive PTS thresholds, while DTH/rock hammers use impulsive thresholds. Second, vibratory pile driving account for the duration to drive a pile, while DTH account for strikes per pile. Thus, it is difficult to measure sound on the same scale and combine isopleths from these impulsive and non-impulsive, continuous sources. Therefore, NMFS has treated each source independently at this time.

Regarding the operation of two DTH hammers concurrently, since DTH hammers are capable of multiple strikes per second, there is potential for multiple DTH/rock hammer sources' isopleths to overlap in space and time (a higher strike rate indicates a greater potential for overlap). Therefore, NMFS has calculated distances to Level A harassment isopleths, by hearing group for simultaneous use of two DTH hammers (Table 13), using NMFS' User Spreadsheet. The inputs for these calculations are outlined in Table 11. When the Level A isopleth of one DTH sound source encompasses the isopleth of another DTH sound source, the sources are considered additive and combined using the rules in Table 7 as described above. The number of piles per day is altered to reflect only a single pile for all those that overlap in space and time (*i.e.*, no double counting of overlapping piles). The maximum strike rate and duration of the two DTH systems is used in the User Spreadsheet calculations.

Table 11-- NMFS User Spreadsheet Inputs for Simultaneous Use of Two DTH Hammers

Spreadsheet Tab Used		E.2) DTH Pile Driving
Weighting Factor Adjustment (kHz)		2
SSL(dB SEL at 10m)[a]	8-in pile/ 8-in pile	147
	8-in pile, 24-in pile	159
	8-in pile, 30-in pile	164
	24-in pile, 24-in pile	162
	24-in pile, 30-in pile	165
	30-in pile, 30-in pile	167
Activity duration (minutes) within 24 hours[b]		60, 120, 180 or 240[c]
Number of piles per day[b]		1
Strike rate (strikes per second)		15 or 25.83[d]

[a] SSL reflects the combined SSLs calculated in Table 7
[b] ADOT anticipates that DTH could occur at one site for up to 10 hours (600 minutes) per day, and overlap between two sites could occur for up to 4 hours (240 minutes) per day. Since the potential overlap in sources is accounted for in the SSL adjustment, and the total potential duration (even with two hammers) is accounted for in the "Activity duration (minutes) within 24 hours," the "Number of piles per day" is assumed to be 1.
[c] Duration will vary.
[d] 25.83 for combinations that include 8-in piles. 15 for all other combinations.

Level A harassment thresholds for impulsive sound sources (impact pile driving and DTH) are defined for both SELcum and Peak SPL with the threshold that results in the largest modeled isopleth for each marine mammal hearing group used to establish the Level A harassment isopleth. In this project, Level A harassment isopleths based on cumulative sound exposure level (SELcum) were always larger than those based on Peak SPL (for both single hammer use and simultaneous use of two hammers). It should be noted that there is a duration component when calculating the Level A harassment isopleth based on SELcum, and this duration depends on the number of piles that will be driven in a day and strikes per pile. For some activities, ADOT plans to drive variable numbers of piles per day throughout the project (See "Average Piles per Day (Range)" in Table 1 in the notice of proposed IHA (87 FR 5980; February 2, 2022)), and determine at the beginning of each pile driving day, the maximum number or duration piles will be driven that day. Here, this flexibility has been accounted for by modeling multiple durations for the activity, and determining the relevant isopleths.

Table 12-- Distances to Level A Harassment Isopleths, by Hearing Group, and Area of Level A Harassment Zones, For Single Hammer Use During Pile Installation and Removal

Activity	Pile diameter(s)	Minutes per pile or strikes per pile	Level A harassment Isopleth (m)					Level A harassment areas (km^2) all hearing groups[a]
			LF	MF	HF	PW	OW	
Vibratory Installation	30-inch	60 minutes	8	1	12	5	1	< 0.1
	24-inch[b]	60 minutes	7	1	11	5	1	< 0.1
	20-inch	60 minutes	7	1	11	5	1	< 0.1
Vibratory Removal	24-inch	60 minutes	7	1	11	5	1	< 0.1
DTH Rock Sockets	30-inch	60 minutes	773	28	920	414	31	< 0.9
		300 minutes	2,258	81	2,690	1,209	88	< 3.5
		600 minutes	3,584	128	4,269	1,918	140	< 6.6
	24-inch	60 minutes	359	13	427	192	15	< 0.2
		300 minutes	1,048	38	1,249	561	41	< 1.4
		600 minutes	1,664	60	1,982	891	65	< 2.4
DTH Tension Anchor	8-inch	120 minutes	82	3	98	44	4	< 0.1
		240 minutes	130	5	155	70	6	< 0.1
Impact Installation	30-inch	50 strikes	100	4	119	54	4	< 0.1
	24-inch	50 strikes	54	2	65	29	3	< 0.1
	20-inch	50 strikes	54	2	65	29	3	< 0.1

[a] Please refer to Table 6-4 of ADOT's IHA application for hearing group-specific areas.
[b] Includes vibratory installation and removal.

Table 13-- Distances to Level A Harassment Isopleths, by Hearing Group for Simultaneous Use of Two DTH Hammers

Activity Combination	Duration	Level A Harassment Isopleth (m)				
		LF	MF	HF	PW	OW
8-in pile, 8-in pile	60	82	3	98	44	3
	120	130	5	155	70	5
	180	170	6	202	91	7
	240	206	7	245	110	8
8-in pile, 24-in pile	60	515	18	613	276	20
	120	817	29	974	437	32
	180	1,071	38	1,276	573	42
	240	1,297	46	1,545	694	51
8-in pile, 30-in pile	60	1,109	40	1,321	594	43
	120	1,761	63	2,097	942	69

	180	2,307	82	2,748	1,235	90
	240	2,796	99	3,329	1,496	109
24-in pile, 24-in pile	60	568	20	677	304	22
	120	902	32	1,074	483	35
	180	1,181	42	1,407	632	46
	240	1,431	51	1,705	766	56
24-in pile, 30-in	60	900	32	1,072	482	35
	120	1,429	51	1,702	765	56
	180	1,873	67	2,230	1,002	73
	240	2,268	81	2,702	1,214	88
30-in pile, 30-in pile	60	1,224	44	1,458	655	48
	120	1,943	69	2,314	1,040	76
	180	2,545	91	3,032	1,362	99
	240	3,084	110	3,673	1,650	120

Regarding implications for impact hammers used in combination with a vibratory hammer or DTH drill, the likelihood of these multiple sources' isopleths to completely overlap in time is slim primarily because impact pile driving is intermittent. Furthermore, non-impulsive, continuous sources rely upon non-impulsive TTS/PTS thresholds, while impact pile driving uses impulsive thresholds, making it difficult to calculate isopleths that may overlap from impact driving and the simultaneous action of a non-impulsive continuous source or one with multiple strikes per second. Thus, with such slim potential for multiple different sources' isopleths to overlap in space and time, specifications should be entered as "normal" into the User Spreadsheet for each individual source separately.

Marine Mammal Occurrence and Take Calculation and Estimation

In this section we provide the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations. Additionally, we describe how the occurrence information is brought together to produce a quantitative take estimate for each phase. A summary of the estimated take, including as a percentage of population for each of the species, is shown in Table 14.

Steller Sea Lion

Steller sea lion abundance in the Tongass Narrows area is not well known. No systematic studies of Steller sea lions have been conducted in or near the Tongass Narrows area. Steller sea lions are known to occur year-round and local residents report observing Steller sea lions approximately once or twice per week (based on communication outlined in Section 6 of ADOT's IHA application). Abundance appears to increase during herring runs (March to May) and salmon runs (July to September). Group sizes may reach up to 6 to 10 individuals (Freitag 2017 as cited in 83 FR 37473; August 1, 2018), though groups of up to 80 individuals have been observed (HDR, Inc. 2003).

ADOT conservatively estimates that one group of 10 Steller sea lions may be present in the project area each day, but this occurrence rate may as much as double (20 Steller sea lions per day) during periods of increased abundance associated with the herring and salmon runs (March to May and July to September). Therefore, ADOT anticipates that two large groups (20 individuals) may be taken by Level B harassment each day during these months. To be conservative, we assume all 91 days of work could be completed during these months of increased abundance and thus estimate 1,820 potential takes by Level B harassment of Steller sea lions in Tongass Narrows (*i.e.*, 2 groups of 10 sea lions per day × 91 construction days = 1,820 takes by Level B harassment; Table 14).

ADOT estimates that simultaneous use of two hammers (any combination) could occur on up to 44 days during the project. On those days, Level B harassment zones will extend into Clarence Strait. Steller sea lions are known to swim across Clarence Strait and to use offshore areas with deeper waters, although no estimates of at-sea density or abundance in Clarence Strait are available. Therefore, ADOT has conservatively estimated, and NMFS concurs, that during the 44 days with potential simultaneous use of two hammers, a group of 10 Steller sea lions may occur in the portion of the Level B

harassment zone in Clarence Strait each day (one group of 10 sea lions per day x 44 days = 440 individuals). Therefore, the preliminary sum of estimated takes by Level B harassment of Steller sea lions between Tongass Narrows and Clarence Strait is 2,260 (1,820 + 440 = 2,260 takes by Level B harassment).

The largest Level A harassment zone for otariid pinnipeds could extend 140 m from the noise source for 10 hours of DTH using a single hammer, or 120m from the noise source for 4 hours of DTH using two hammers for 30-in piles simultaneously. (As noted previously, ADOT estimates that simultaneous use of any two hammer types will occur on no more than 44 days). Zones for shorter durations and other activities will be smaller (Table 12). For some DTH activities, the estimated Level A harassment zone is larger than the shutdown zone, and therefore, some Level A harassment could occur. Further, while unlikely, it is possible that a Steller sea lion could enter a shutdown zone without detection given the various obstructions along the shoreline, and remain in the zone long enough to be taken by Level A harassment before being observed and a shutdown occurring. ADOT therefore requested, and NMFS authorized, one take by Level A harassment on each of the 91 construction days (91 takes by Level A harassment). Authorized take by Level B harassment was calculated as the total calculated Steller sea lion takes by Level B harassment minus the takes by Level A harassment (2,260 takes – 91 takes by Level A harassment) for a total of 2,169 takes by Level B harassment. Therefore, ADOT requested, and NMFS authorized, 91 takes of Steller sea lion by Level A harassment and 2,169 takes of Steller sea lion by Level B harassment (2,260 total takes of Steller sea lion; Table 14).

Harbor Seal

Harbor seal densities in the Tongass Narrows area are not well known. No systematic studies of harbor seals have been conducted in or near Tongass Narrows. They are known to occur year-round with little seasonal variation in abundance (Freitag 2017

as cited in 83 FR 37473; August 1, 2018) and local experts estimate that there are about 1 to 3 harbor seals in Tongass Narrows every day, in addition to those that congregate near the seafood processing plants and fish hatcheries. NMFS has indicated that the maximum group size in Tongass Narrows is three individuals (83 FR 22009; May 11, 2018); however, ADOT monitoring in March 2021 observed several groups of up to 5 individuals. Based on this knowledge, the expected maximum group size in Tongass Narrows is five individuals. Harbor seals are known to be curious and may approach novel activity. For these reasons ADOT conservatively estimates that up to two groups of 5 harbor seals per group could be taken by Level B harassment due to project-related underwater noise each construction day for a total of 910 takes by Level B harassment of harbor seal in Tongass Narrows (*i.e.*, 2 groups of 5 harbor seals per day × 91 construction days = 910 total takes by Level B harassment of harbor seal; Table 14).

As noted above, ADOT estimates that simultaneous use of two hammers (any combination) could occur on up to 44 days during the project. On those days, Level B harassment zones will extend into Clarence Strait. Harbor seals are known to swim across Clarence Strait, although no estimates of at-sea density or abundance in Clarence Strait are available. It is likely that harbor seal abundance in Clarence Strait is lower than in Tongass Narrows, as harbor seals generally prefer nearshore waters. Therefore, ADOT has conservatively estimated, and NMFS concurs, that during the 44 days with potential simultaneous use of two hammers, a group of 5 harbor seals may occur in the portion of the Level B harassment zone in Clarence Strait each day (one group of 5 harbor seals per day x 44 days = 220 individuals). Therefore, the sum of total estimated takes by Level B harassment of harbor seals between Tongass Narrows and Clarence Strait is 1,130 (910 + 220 = 1,130 takes by Level B harassment).

The largest Level A harassment zone for harbor seals could extend 1,918 m from the noise source for 10 hours of DTH using a single hammer, or 1,640 m from the noise

source for 4 hours of DTH using two hammers for 30-in piles simultaneously. (As noted previously, ADOT estimates that simultaneous use of any two hammer types will occur on no more than 44 days). Zones for shorter durations and other activities will be smaller (Table 12). Due to practicability concerns, NMFS is requiring a 200 m shutdown zone for harbor seals during 24-in and 30-in DTH activities (Table 15). Therefore, for some DTH activities, the estimated Level A harassment zone is larger than the shutdown zone, and therefore, some Level A harassment could occur. Harbor seals may enter and remain within the area between the Level A harassment zone and the shutdown zone for a duration long enough to be taken by Level A harassment. Additionally, while unlikely, it is possible that a harbor seal could enter a shutdown zone without detection given the various obstructions along the shoreline, and remain in the zone for a duration long enough to be taken by Level A harassment before being observed and a shutdown occurring.

To calculate take by Level A harassment, ADOT first calculated the ratio of the maximum Level A harassment isopleth for 30-in DTH using a single hammer minus the shutdown zone isopleth (1,918 m - 200 m shutdown zone = 1,718 m) to the Level B harassment zone isopleth (13,594 m; 1,718 m/13,594 m = 0.1264). ADOT multiplied the resulting ratio by the total potential take in Tongass Narrows, resulting in 116 takes by Level A harassment (*i.e.*, 910 takes by Level B harassment x 0.1264 = 116 takes by Level A harassment). NMFS reviewed, and concurs with and adopts this method. (Potential operation of two DTH hammers for 24-in/30-in or 30-in/30-in pile combinations would result in larger Level A harassment isopleths than 1,918 m, however, such concurrent work will rarely occur, if at all, and therefore, NMFS expects that calculating Level A harassment take using those zones would be overly conservative and unrealistic. Moreover, since the method used above assumes 30-inch DTH on all days it provided a precautionary cushion since activities with smaller Level A harassment zone sizes will

occur on many days.) Authorized take by Level B harassment was calculated as the total calculated harbor seal takes by Level B harassment minus the takes by Level A harassment (1,130 takes- 116 takes by Level A harassment) for a total of 1,014 takes by Level B harassment. ADOT therefore requested, and NMFS authorized, 116 takes of harbor seal by Level A harassment and 1,014 takes of harbor seal by Level B harassment (1,130 total takes of harbor seal; Table 14).

Harbor Porpoise

Harbor porpoises are non-migratory; therefore, our occurrence estimates are not dependent on season. Freitag (2017 as cited in 83 FR 37473; August 1, 2018) observed harbor porpoises in Tongass Narrows zero to one time per month. Harbor porpoises observed in the project vicinity typically occur in groups of one to five animals with an estimated maximum group size of eight animals (83 FR 37473, August 1, 2018, Solstice 2018). ADOT's 2020 and 2021 monitoring program in Tongass Narrows did not result in sightings of this species; however, ADOT assumes an occurrence rate of one group per month in the following take estimations. For our analysis, we are considering a group to consist of five animals. Based on Freitag (2017), and supported by the reports of knowledgeable locals as described in ADOT's application, ADOT estimates that one group of five harbor porpoises could enter Tongass Narrows and potentially taken by Level B harassment due to project-related noise each month for a total of 15 potential harbor porpoise takes by Level B harassment in Tongass Narrows (*i.e.*, 1 group of 5 individuals x 3 months (91 days) = 15 harbor porpoises).

As noted above, ADOT estimates that simultaneous use of two hammers (any combination) could occur on up to 44 days during the project. On those days, the Level B harassment zone will extend into Clarence Strait. Harbor porpoises are known to swim across Clarence Strait and to use other areas of deep, open waters. Dahlheim *et al.* (2015) estimated a density of 0.02 harbor porpoises/km^2 in an area that encompasses Clarence

Strait. ADOT estimates, and NMFS concurs that during the 44 days with potential simultaneous use of two hammers, 17 harbor porpoises (0.02 harbor porpoises/km^2 x 18.5 km^2 x 44 days = 17 harbor porpoises) may occur in the portion of the Level B harassment zone in Clarence Strait during the project (though ADOT and NMFS anticipate that this is a conservative estimate, given the entire 18.5 km^2 area will rarely be ensonified above the Level B harassment threshold). Therefore, the sum of total estimated takes by Level B harassment of harbor porpoise between Tongass Narrows and Clarence Strait is 32 (15 + 17 = 32 takes by Level B harassment).

The largest Level A harassment zone for harbor porpoises extends 4,269 m from the noise source for 10 hours of DTH using a single hammer, and 3,673 m from the noise source for 4 hours of DTH using two hammers for 30-in piles simultaneously. (As noted previously, ADOT estimates that simultaneous use of any two hammer types will occur on no more than 44 days). Zones for shorter durations and other activities will be smaller (Table 12). Due to practicability concerns, NMFS is requiring a 500 m shutdown zone for high frequency cetaceans during 24-in and 30-in DTH activities. Therefore, for some DTH activities, the estimated Level A harassment zone is larger than the shutdown zone, and therefore, some Level A harassment could occur. Harbor porpoises may enter and remain within the area between the Level A harassment zone and the shutdown zone for a duration long enough to be taken by Level A harassment. Additionally, given the large size of required shutdown zones for some activities and the cryptic nature of harbor porpoises, it is possible that a harbor porpoise could enter a shutdown zone without detection and remain in the zone for a duration long enough to be taken by Level A harassment before being observed and a shutdown occurring.

To calculate take by Level A harassment, ADOT first calculated the ratio of the maximum Level A harassment isopleth for 30-in DTH using a single hammer minus the shutdown zone isopleth (4,269 m – 500 m =3,769 m) to the Level B harassment zone

isopleth (13,594 m; 3,769/13,594 = 0.2773). ADOT multiplied the resulting ratio by the total potential take in Tongass Narrows, resulting in 5 takes by Level A harassment (*i.e.*, 15 takes by Level B harassment x 0.2773 = 5 takes by Level A harassment). NMFS reviewed and concurs with this method. (Potential operation of two DTH hammers for 24-in/30-in or 30-in/30-in pile combinations would result in larger Level A harassment isopleths than 4,269 m, however, such concurrent work would rarely occur, if at all, and therefore, as described above, NMFS expects that calculating Level A harassment take using those zones is unnecessary.) Authorized take by Level B harassment was calculated as the total calculated harbor porpoise takes by Level B harassment minus the takes by Level A harassment (32 takes – 5 takes by Level A harassment) for a total of 27 takes by Level B harassment. ADOT therefore requested and NMFS authorized 5 takes by Level A harassment and 27 takes by Level B harassment (32 total takes of harbor porpoise; Table 14).

Dall's Porpoise

Dall's porpoises are expected to only occur in the project area a few times per year. Their relative rarity is supported by Jefferson *et al.*' s (2019) presentation of historical survey data showing very few sightings in the Ketchikan area and conclusion that Dall's porpoise generally are rare in narrow waterways, like the Tongass Narrows. ADOT's monitoring program from 2020 and 2021 recorded one sighting of 6 individuals over 23 days of observation, 16 days of observations with no sightings, and two sightings of 10 individuals in 14 days of observation; this equates to one sighting every approximately 17 days (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d) or approximately two sightings per month. This species is non-migratory; therefore, the occurrence estimates are not dependent on season. ADOT anticipates that one large Dall's porpoise pod (12 individuals) may be present in the project area and exposed to project related underwater noise twice each month during 3 months of construction (91 days rounded to

3 months) for a total of 72 potential takes by Level B harassment in Tongass Narrows (*i.e.,* 2 groups of 12 Dall's porpoises per month x 3 months = 72 potential takes by Level B harassment).

As noted above, ADOT estimates that simultaneous use of two hammers (any combination) could occur on up to 44 days during the project. On those days, the Level B harassment zone will extend into Clarence Strait, where Dall's porpoises are known to occur. Jefferson *et al.* (2019) estimated an average density of 0.19 Dall's porpoises/km^2 in Southeast Alaska. ADOT estimates, and NMFS concurs, that during the 44 days with potential simultaneous use of two hammers, 155 Dall's porpoises (0.19 Dall's porpoises/km^2 x 18.5 km^2 x 44 days = 155 Dall's porpoises) may occur in the portion of the Level B harassment zone in Clarence Strait during the project (though ADOT and NMFS anticipate that this is a conservative estimate, given the entire 18.5 km^2 area will rarely be ensonified above the Level B harassment threshold). Therefore, the sum of total estimated takes by Level B harassment of harbor porpoise between Tongass Narrows and Clarence Strait is 227 (72 + 155= 227 takes by Level B harassment).

The largest Level A harassment zone for Dall's porpoises extends 4,269 m from the noise source for 10 hours of DTH using a single hammer, and 3,673 m from the noise source for 4 hours of DTH using two hammers for 30-in piles simultaneously. (As noted previously, ADOT estimates that simultaneous use of any two hammer types will occur on no more than 44 days.) Zones for shorter durations and other activities will be smaller (Table 12). Due to practicability concerns, NMFS proposes to require a 500 m shutdown zone for high frequency cetaceans during 24-in and 30-in DTH activities. Therefore, for some DTH activities, the estimated Level A harassment zone is larger than the shutdown zone, and therefore, some Level A harassment could occur. Dall's porpoises may enter and remain within the area between the Level A harassment zone and the shutdown zone and be exposed to sound levels for a duration long enough to be taken by Level A

harassment. Additionally, given the large size of the required shutdown zones for some activities, it is possible that a Dall's porpoise could enter a shutdown zone without detection and remain in the zone for a duration long enough to taken by Level A harassment before being observed and a shutdown occurring.

To calculate take by Level A harassment, ADOT first calculated the ratio of the maximum Level A harassment isopleth for 30-in DTH using a single hammer minus the shutdown zone isopleth (4,269 m – 500 m =3,769 m) to the Level B harassment zone isopleth (13,594 m; 3,769/13,594 = 0.2773). ADOT multiplied the resulting ratio by the total potential take in Tongass Narrows, resulting in 20 takes by Level A harassment (*i.e.*, 72 takes by Level B harassment x 0.2773 = 20 takes by Level A harassment). NMFS revised and concurs with this method. (Potential operation of two DTH hammers for 24-in/30-in or 30-in/30-in pile combinations would result in larger Level A harassment isopleths than 4,269 m, however, such concurrent work would rarely occur, if at all, and therefore, as described above, NMFS expects that calculating Level A harassment take using those zones is unnecessary.) Authorized take by Level B harassment was calculated as the total calculated Dall's porpoise takes by Level B harassment minus the takes by Level A harassment (227 takes – 20 takes by Level A harassment) for a total of 207 takes by Level B harassment. ADOT therefore requested and NMFS authorized 20 takes by Level A harassment, and 207 takes by Level B harassment (227 total takes of Dall's porpoise; Table 14).

Pacific White-Sided Dolphin

Pacific white-sided dolphins do not generally occur in the shallow, inland waterways of Southeast Alaska. There are no records of this species occurring in Tongass Narrows, and it is uncommon for individuals to occur in the project area. However, historical sightings in nearby areas (Dahlheim and Towell 1994; Muto *et al.* 2018) and

recent fluctuations in distribution and abundance mean it is possible the species could be present.

To account for the possibility that this species could be present in the project area, ADOT conservatively estimates, and NMFS concurs, that one large group (92 individuals) of Pacific white-sided dolphins may be taken by Level B harassment in Tongass Narrows during the activity.

As noted above, ADOT estimates that simultaneous use of two hammers (any combination) could occur on up to 44 days during the project. On those days, the Level B harassment zone will extend into Clarence Strait. However, no additional takes of Pacific white-sided dolphin are anticipated to occur due to simultaneous use of two hammers, given that Pacific white-sided dolphins are uncommon in the project area. Therefore, NMFS authorized 92 takes by Level B harassment of Pacific white-sided dolphins.

ADOT did not request, nor did NMFS authorize take by Level A harassment for this activity given that Pacific white-sided dolphins are uncommon in the project area. Further, considering the small Level A harassment zones for mid-frequency cetaceans (Table 12 and Table 13) in comparison to the required shutdown zones, it is unlikely that a Pacific white-sided dolphin will enter and remain within the area between the Level A harassment zone and the shutdown zone for a duration long enough to be taken by Level A harassment.

Killer Whale

Killer whales are observed in Tongass Narrows irregularly with peaks in abundance between May and July. During 7 months of intermittent marine mammal monitoring (October 2020–February 2021; May–June 2021), there were five killer whale sightings in 4 months (November, February, May, June) totaling 22 animals; sightings occurred on 5 out of 88 days of monitoring (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). Pod sizes ranged from two to eight animals (DOT&PF 2020, 2021a, 2021b,

2021c, 2021d). Previous incidental take authorizations in the Ketchikan area have estimated killer whale occurrence in Tongass Narrows at one pod per month, except during the peak period of May to July when estimates have included two pods per month (Freitag 2017 as cited in 83 FR 37473; August 1, 2018 and 83 FR 34134; July 17, 2019).

As noted above, ADOT estimates that simultaneous use of two hammers (any combination) could occur on up to 44 days during the project. On those days, the Level B harassment zone will extend into Clarence Strait. In estimating take by Level B harassment, ADOT assumed a pod size of 12 killer whales, that all 91 days of work will occur between May and July during the peaks in abundance, and that therefore, 2 pods may occur within the Level B harassment zone (including both Tongass Narrows and Clarence Strait) during each month of work, for a total of 72 takes by Level B harassment (2 groups x 12 individuals x 3 months =72 killer whales). Therefore, ADOT estimates that a total of 72 killer whales may be taken by Level B harassment (*i.e.*, 2 pods of 12 individuals per month x 3 months (91 days) = 72 takes by Level B harassment). NMFS reviewed and concurs with this method, and authorized 72 takes by Level B harassment of killer whale.

ADOT did not request, nor did NMFS authorize take by Level A harassment of killer whales for this activity. Considering the small Level A harassment zones for mid-frequency cetaceans (Table 12 and Table 13) in comparison to the required shutdown zones, it is unlikely that a killer whale will enter and remain within the area between the Level A harassment zone and the shutdown zone for a duration long enough to be taken by Level A harassment.

Humpback Whale

As discussed in the **Description of Marine Mammals in the Area of Specified Activities** section, locals have observed humpback whales an average of about once per week in Tongass Narrows, but there is evidence to suggest occurrence may be higher

during some periods of the year. The December 19, 2019 Biological Opinion stated that based on observations by local experts, approximately one group of two individuals will occur in Tongass Narrows during ADOT's activity two times per seven days during pile driving, pile removal, and DTH activities throughout the year. The assumption was based on differences in abundance throughout the year, recent observations of larger groups of whales present during summer, and a higher than average frequency of occurrence in recent months (NMFS 2019). ADOT's 2020 and 2021 monitoring program documented a similar sighting rate, with 30 humpback whale sightings over 53 days of in-water pile driving; some of the sightings were believed to be repeated sightings of the same individual (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). ADOT therefore predicts, and NMFS concurs, that one group of two individuals may occur within the Level B harassment zones twice per week during the planned activities. As noted previously, ADOT estimates that pile driving will occur over the course of 91 days (13 weeks). Therefore, ADOT estimates, and NMFS concurs that 52 takes by Level B harassment of humpback whales (1 group of 2 individuals x 2 groups per week x 13 weeks = 52 takes by Level B harassment) from the Central North Pacific stock may occur in Tongass Narrows.

As noted above, ADOT estimates that simultaneous use of two hammers (any combination) could occur on up to 44 days during the project. On those days, the Level B harassment zone will extend into Clarence Strait. Local specialists estimated that approximately four humpback whales could pass through or near the portion of the Level B harassment zone in Clarence Strait each day. Therefore, ADOT estimates, and NMFS concurs, that during the 44 days with potential simultaneous use of two hammers, 176 takes by Level B harassment of humpback whale could occur in Clarence Strait (4 humpback whales x 44 days = 176 takes by Level B harassment). Therefore, the sum of total estimated takes by Level B harassment of humpback whale between Tongass

Narrows and Clarence Strait is 228 (52 + 176 = 228 takes by Level B harassment), and NMFS authorized 228 takes by Level B harassment of humpback whale.

As noted previously, Wade *et al.* (2021) estimates that approximately 2 percent of all humpback whales in Southeast Alaska and northern British Columbia are of the Mexico DPS, while all others are of the Hawaii DPS. However, NMFS has conservatively assumed here that 6.1 percent of the total humpback population in Southeast Alaska is from the Mexico DPS (Wade *et al.* 2016). Therefore, of the 228 takes of humpback whale authorized, NMFS expects that a total of 14 takes will be of individuals from the Mexico DPS. NMFS expects that all other instances of take will be from the non-listed Hawaii DPS.

Take by Level A harassment of humpback whales is neither anticipated nor authorized because of the expected effectiveness of the required monitoring and mitigation measures (see **Mitigation Measures** section below for more details). For all pile driving and DTH activities, the shutdown zone exceeds the calculated Level A harassment zone. Humpbacks are usually readily visible, and therefore, we expect protected species observers (PSOs) to be able to effectively implement the required shutdown measures prior to any humpback whales incurring PTS within Level A harassment zones.

Minke Whales

Minke whales may be present in Tongass Narrows year-round. Their abundance throughout Southeast Alaska is very low, and anecdotal reports have not included minke whales near the project area. ADOT's monitoring program in Tongass Narrows also did not report any minke whale sightings. However, minke whales are distributed throughout a wide variety of habitats and could occur near the project area. Minke whales are generally sighted as solo individuals (Dahlheim *et al.* 2009).

As noted above, ADOT estimates that simultaneous use of two hammers (any combination) could occur on up to 44 days during the project. On those days, the Level B harassment zone will extend into Clarence Strait. Based on Freitag (2017; as cited in 83 FR 37473; August 1, 2018 and 83 FR 34134; July 17, 2019), ADOT estimates that three individual minke whales may occur near or within the Level B harassment zone (including both Tongass Narrows and Clarence Strait) every four months. Based on that estimated occurrence rate, NMFS estimates that 3 minke whales may occur in the Level B harassment zone during the planned activities (occurring over approximately 3 months), and authorized 3 takes by Level B harassment of minke whales (Table 14).

The largest Level A harassment zone for minke whale extends 3,584 m from the noise source for 10 hours of DTH using a single hammer, and 3,084 m from the noise source for 4 hours of DTH using two hammers for 30-in piles simultaneously. (As noted previously, ADOT estimates that simultaneous use of any two hammer types will occur on no more than 44 days.) Zones for shorter durations and other activities will be smaller (Table 13). NMFS required a 1,500 m shutdown zone for minke whales during 24-in and 30-in DTH activities. Therefore, for some DTH activities, the estimated Level A harassment zone is larger than the required shutdown zone, and Level A harassment could occur.

To calculate take by Level A harassment, ADOT first calculated the ratio of the maximum Level A harassment isopleth for 30-in DTH using a single hammer minus the shutdown zone isopleth (3,584 m - 1,500 m = 2,084 m) to the Level B harassment zone isopleth (13,594 m; 2,084 m/13,594 m = 0.1533). ADOT multiplied the resulting ratio by the total potential take by Level B harassment, resulting in 1 take by Level A harassment (*i.e.*, 3 takes by Level B harassment x 0.1533 = 1 take by Level A harassment). NMFS reviewed and concurs with this method. (Potential operation of two DTH hammers for 24-in/30-in or 30-in/30-in pile combinations would result in larger Level A harassment

isopleths than 4,269 m, however, such concurrent work would rarely occur, if at all, and therefore, as described above NMFS expects that calculating Level A harassment take using those zones is unnecessary.) Take by Level B harassment was calculated as the total potential minke whale takes by Level B harassment minus the takes by Level A harassment. ADOT therefore requested, and NMFS authorized 1 take by Level A harassment and 2 takes by Level B harassment (3 total takes of minke whale; Table 14).

Table 14-- Authorized Take as a Percentage of Stock Abundance, by Stock and Harassment Type

		Authorized Take			
Species	**DPS/Stock**	**Level A Harassment**	**Level B Harassment**	**Total**	**Percent of Stock**
Steller sea lion	Eastern U.S.	91	2,169	2,260	5.2
Harbor seal	Clarence Strait	116	1,014	1,130	4.1
Harbor porpoise	Southeast Alaska	5	27	32	2.5
Dall's porpoise	Alaska	20	207	227	1.7
Pacific white-sided dolphin	North Pacific	0	92	92	0.3
Killer whale	Alaska Resident	0	72	72	[a]3.1
	West Coast Transient				[a]20.1
	Northern Resident				[a]23.8
Humpback whale	Central North Pacific	0	228	228	2.3
Minke whale	Alaska	1	2	3	N/A

[a] Conservatively assumes that all 72 takes occur to each stock.

Mitigation Measures

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses. NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting the activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, we carefully consider two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned), and;

(2) The practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

Because of the need for an ESA Section 7 consultation for effects of the project on ESA listed humpback whales, there are a number of mitigation measures that go beyond, or are in addition to, typical mitigation measures we would otherwise require for this sort of project. However, these measures are typical for actions in the Ketchikan area. The mitigation measures included herein include measures that align with the 2019 Biological Opinion. ADOT must employ the following mitigation measures as included in the proposed IHA:

- Avoid direct physical interaction with marine mammals during construction activity. If a marine mammal comes within 10 m of such activity, operations must cease and vessels must reduce speed to the minimum level required to maintain steerage and safe working conditions (note that NMFS expects that a 10 m shutdown zone is sufficient to avoid direct physical interaction with marine mammals, but ADOT conservatively proposed a 20 m shutdown zone to avoid physical interaction for in-water other than vessel transit);
- Ensure that construction supervisors and crews, the monitoring team and relevant ADOT staff are trained prior to the start of all pile driving and DTH activity, so that responsibilities, communication procedures, monitoring protocols, and operational procedures are clearly understood. New personnel joining during the project must be trained prior to commencing work;
- Pile driving activity must be halted upon observation of either a species for which incidental take is not authorized or a species for which incidental take has been authorized but the authorized number of takes has been met, entering or within the harassment zone;
- For any marine mammal species for which take by Level B harassment has not been requested or authorized, in-water pile installation/removal and DTH will shut down immediately when the animals are sighted;

- Employ PSOs and establish monitoring locations as described in the Marine Mammal Monitoring Plan and Section 5 of the IHA. The Holder must monitor the project area to the maximum extent possible based on the required number of PSOs, required monitoring locations, and environmental conditions. For all pile driving and removal at least three PSOs must be used;
- The placement of the PSOs during all pile driving and removal and DTH activities will ensure that the entire shutdown zone is visible during pile installation;
- Monitoring must take place from 30 minutes prior to initiation of pile driving or DTH activity (*i.e.*, pre-clearance monitoring) through 30 minutes post-completion of pile driving or DTH activity;
- If in-water work ceases for more than 30 minutes, ADOT will conduct pre-clearance monitoring of both the Level B harassment zone and shutdown zone;
- Pre-start clearance monitoring must be conducted during periods of visibility sufficient for the lead PSO to determine that the shutdown zones indicated in Table 15 are clear of marine mammals. Pile driving may commence following 30 minutes of observation when the determination is made that the shutdown zones are clear of marine mammals;
- If a marine mammal is observed entering or within the shutdown zones indicated in Table 15, pile driving must be delayed or halted. If pile driving is delayed or halted due to the presence of a marine mammal, the activity may not commence or resume until either the animal has voluntarily exited and been visually confirmed beyond the shutdown zone (Table 15) or 15 minutes have passed without re-detection of the animal (30 minutes for humpback whales);
- As required by the 2019 Biological Opinion, if waters exceed a sea state that restricts the PSOs' ability to make observations within the shutdown zone, in-water

pile installation and removal will cease. Pile installation and removal will not be initiated or continue until the appropriate shutdown zone is visible in its entirety;

- For humpback whales, if the boundaries of the harassment zone have not been monitored continuously during a work stoppage, the entire harassment zone will be surveyed again to ensure that no humpback whales have entered the harassment zone that were not previously accounted for;
- In-water activities will take place only: between civil dawn and civil dusk when PSOs can effectively monitor for the presence of marine mammals; during conditions with a Beaufort Sea State of 4 or less; when the entire shutdown zone and adjacent waters are visible (*e.g.*, monitoring effectiveness is not reduced due to rain, fog, snow, etc.). Pile driving may continue for up to 30 minutes after sunset during evening civil twilight, as necessary to secure a pile for safety prior to demobilization for the evening. PSO(s) will continue to observe shutdown and monitoring zones during this time. The length of the post- activity monitoring period may be reduced if darkness precludes visibility of the shutdown and monitoring zones;
- Vessel operators will implement the following required measures: maintain a watch for marine mammals at all times while underway; remain at least and at least 91 m (100 yards (yd)) from all other listed marine mammals, travel at less than 5 knots (9 km/hr) when within 274 m (300 yd) of a whale; avoid changes in direction and speed when within 274 m (300 yd) of whales, unless doing so is necessary for maritime safety; not position vessel(s) in the path of whales, and will not cut in front of whales in a way or at a distance that causes the whales to change their direction of travel or behavior (including breathing/surfacing pattern); check the waters immediately adjacent to the vessel(s) to ensure that no whales will be injured when the propellers are engaged; adhere to the Alaska Humpback Whale Approach Regulations when transiting to and from the project site (see 50 CFR 216.18, 223.214, and 224.103(b)); not allow lines to remain in

the water, and not throw trash or other debris overboard, thereby reducing the potential for marine mammal entanglement; follow established transit routes and travel <10 knots while in the harassment zones; follow the speed limit within Tongass Narrows (7 knots for vessels over 23 ft in length). If a whale's course and speed are such that it will likely cross in front of a vessel that is underway, or approach within 91 m (100 yards (yd)) of the vessel, and if maritime conditions safely allow, the engine will be put in neutral and the whale will be allowed to pass beyond the vessel, except that vessels will remain 460 m (500 yd) from North Pacific right whales; if a humpback whale comes within 10 m (32.8 ft) of a vessel during construction, the vessel will reduce speed to the minimum level required to maintain safe steerage and working conditions until the humpback whale is at least 10 m (32.8 ft) away from the vessel; vessels are prohibited from disrupting the normal behavior or prior activity of a whale by any other act or omission.

- ADOT must use soft start techniques when impact pile driving. Soft start requires contractors to provide an initial set of three strikes at reduced energy, followed by a 30-second waiting period, then two subsequent reduced-energy strike sets. A soft start must be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of 30 minutes or longer; and
- If take by Level B harassment reaches the authorized limit for an authorized species, pile installation will be stopped as these species approach the Level B harassment zone to avoid additional take of them.

Further, on days when simultaneous use of two hammers producing continuous noise (two DTH hammers, one DTH and one vibratory hammer, or two vibratory hammers) is expected:

- When combinations of one DTH hammer with a vibratory hammer or two DTH hammers are used simultaneously, each PSO of the two contractors will have three PSOs working and the PSO teams will work together to monitor the entire area;

- One or more PSOs will be present at each construction site during in-water pile installation and removal so that Level A harassment zones and shutdown zones are monitored by a dedicated PSO at all times.
- The ADOT environmental coordinator for the project will implement coordination between or among the PSO contractors. ADOT will include in the contracts that PSOs must coordinate, collaborate, and otherwise work together to ensure compliance with project permits and authorizations.

The following specific mitigation measures will also apply to ADOT's in-water construction activities:

Establishment of Level A Harassment Zones and Shutdown Zones —For all pile driving/removal and DTH activities, ADOT will establish a shutdown zone (Table 15). The purpose of a shutdown zone is generally to define an area within which shutdown of activity will occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). Shutdown zones vary based on the activity type and duration and marine mammal hearing group (Table 15). For vibratory installation and removal and impact installation, shutdown zones will be based on the Level A harassment isopleth distances for each hearing group.

ADOT anticipates that the daily duration of DTH use may vary significantly, with large differences in maximum zones sizes possible depending on the work planned for a given day. Given this uncertainty and concerns related to ESA-listed humpback whales, ADOT will utilize a tiered system to identify and monitor the appropriate Level A harassment zones and shutdown zones, based on the maximum expected DTH duration. At the start of any work involving DTH, ADOT will first determine whether DTH may occur at two sites concurrently or just at one site. If DTH may occur at two sites concurrently, then ADOT will implement the Level A harassment zones and shutdown zones associated with simultaneous DTH use of the relevant pile sizes (Table 13 and

Table 15). If DTH may only occur at one site, ADOT will then determine the maximum duration of DTH possible that day (according to the defined duration intervals in Table 15), which will determine the appropriate Level A harassment isopleth for that day (Table 12 and Table 13). This Level A harassment zone and associated shutdown zone must be observed by PSO(s) for the entire work day or until it is determined that, given the duration of activity for the day, the Level A harassment isopleth cannot exceed the next lower Level A harassment isopleth size in Table 12.

Due to practicability concerns, shutdown zones for some species during some activities may be smaller than the Level A harassment isopleths (Table 15). The placement of PSOs during all pile driving, pile removal, and DTH activities (described in detail in the **Monitoring and Reporting** section) will ensure that the entire shutdown zones are visible during pile installation.

Table 15-- Shutdown Zones and Level B Harassment Isopleths for Each Activity

<table>
<tr><th rowspan="2">Activity</th><th rowspan="2">Pile Size (in)</th><th rowspan="2">Minutes per Pile or Strikes per Pile</th><th colspan="6">Shutdown Distances (m)</th><th rowspan="2">Level B Harassment Isopleth (m)</th></tr>
<tr><th>LF (humpback whales)</th><th>LF (minke whales)</th><th>MF</th><th>HF</th><th>PW</th><th>OW</th></tr>
<tr><td rowspan="3">Vibratory Installation</td><td>30</td><td>60 min</td><td rowspan="4">50</td><td colspan="5" rowspan="4">20</td><td>6,310</td></tr>
<tr><td>24</td><td>60 min</td><td rowspan="3">5,412</td></tr>
<tr><td>20</td><td>60 min</td></tr>
<tr><td>Vibratory Removal</td><td>24</td><td>60 min</td></tr>
<tr><td rowspan="12">DTH of Rock Sockets</td><td rowspan="12">30</td><td>60 min</td><td>780</td><td rowspan="12">1,500</td><td>30</td><td rowspan="12">500</td><td rowspan="12">200</td><td>40</td><td rowspan="12">13,594</td></tr>
<tr><td>120 min</td><td>1,300</td><td>50</td><td>50</td></tr>
<tr><td>180 min</td><td>1,700</td><td>60</td><td>70</td></tr>
<tr><td>240 min</td><td>2,000</td><td>70</td><td>80</td></tr>
<tr><td>300 min</td><td>2,300</td><td>90</td><td>90</td></tr>
<tr><td>360 min</td><td>2,600</td><td rowspan="6">100</td><td rowspan="6">100</td></tr>
<tr><td>420 min</td><td>2,900</td></tr>
<tr><td>480 min</td><td>3,100</td></tr>
<tr><td>540 min</td><td>3,400</td></tr>
<tr><td>600 min</td><td>3,600</td><td>130</td><td>100</td></tr>
</table>

	24	60 min	360	1,500	20	500	200	20	
		120 min	570		30			30	
		180 min	750		30			30	
		240 min	910		40			40	
		300 min	1,100		40			50	
		360 min	1,200		50			50	
		420 min	1,400		50			60	
		480 min	1,500		60			60	
		540 min	1,600		60			70	
		600 min	1,700		60			70	
DTH of Tension Anchor	8	120 min	90	90	20	100	50	20	
		240 min	130	130		160	70		
Impact Installation	30	50 strikes	100	100	20	120	60	20	2,154
	24	50 strikes	60	60		70	30		1,000
	20	50 strikes							

Table 16-- Shutdown Zones, by Hearing Group for Simultaneous Use of Two DTH Hammers

Activity Combination	Duration (minutes)	Level A Harassment Isopleth (m)				
		LF	MF	HF	PW	OW
8-in pile, 8-in pile	60	90	20	100	50	20
	120	130		160	70	
	180	170		200	100	
	240	210		250	110	
8-in pile, 24-in pile	60	520	20	500	200	20
	120	820	30			40
	180	1,080	40			50
	240	1,300	50			60
8-in pile, 30-in pile	60	1,110	40			50
	120	1,770	70			70
	180	2,310	90			90
	240	2,800	100			110
24-in pile, 24-in pile	60	570	20			30
	120	910	32			40
	180	1,190	42			50
	240	1,440	60			60
24-in pile, 30-in	60	900	40			40
	120	1,430	60			60
	180	1,880	70			80
	240	2,270	90			90
30-in pile, 30-in pile	60	1,230	50			50
	120	1,950	70			80
	180	2,550	100			100
	240	3,090	110			120

ADOT also must abide by the terms and conditions of the December 19, 2019 Biological Opinion and Incidental Take Statement issued by NMFS pursuant to section 7 of the Endangered Species Act.

Based on our evaluation of the applicant's proposed measures, as well as other measures considered by NMFS, NMFS has determined that the required mitigation measures provide the means effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the project area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density).
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of

marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas).

- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors.
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks.
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat).
- Mitigation and monitoring effectiveness.

Visual Monitoring

Monitoring must be conducted by qualified, NMFS-approved PSOs, in accordance with the following:

- PSOs must be independent (*i.e.*, not construction personnel) and have no other assigned tasks during monitoring periods. At least one PSO must have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued IHA. Other PSOs may substitute other relevant experience, education (degree in biological science or related field), or training for prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued IHA. Where a team of three or more PSOs is required, a lead observer or monitoring coordinator must be designated. The lead observer must have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization. PSOs must be approved by NMFS prior to beginning any activity subject to this IHA; and
- PSOs must record all observations of marine mammals as described in the Section 5 of the IHA and the Marine Mammal Monitoring Plan, regardless of distance

from the pile being driven. PSOs shall document any behavioral reactions in concert with distance from piles being driven or removed;

PSOs must have the following additional qualifications:

- Ability to conduct field observations and collect data according to assigned protocols;
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary;

Additionally, as required by NMFS' December 2019 Biological Opinion, each PSO will be trained and provided with reference materials to ensure standardized and accurate observations and data collection.

ADOT must employ three PSOs during all pile driving and DTH. A minimum of one PSO (the lead PSO) must be assigned to the active pile driving or DTH location to monitor the shutdown zones and as much of the Level B harassment zones as possible. Two additional PSOs are also required, though the observation points may vary depending on the construction activity and location of the piles. To select the best observation locations, prior to start of construction, the lead PSO will stand at the

construction site to monitor the Level A harassment zones while two or more PSOs travel in opposite directions from the project site along Tongass Narrows until they have reached the edge of the appropriate Level B harassment zone, where they will identify suitable observation points from which to observe. When needed, an additional PSO will be stationed on the north end of Revilla Island observing to the northwest. See Figure 2-11 of ADOT's Marine Mammal Monitoring and Mitigation Plan for a map of planned PSO locations. If visibility deteriorates so that the entire width of Tongass Narrows at the harassment zone boundary is not visible, additional PSOs may be positioned so that the entire width is visible, or work will be halted until the entire width is visible to ensure that any humpback whales entering or within the harassment zone are detected by PSOs.

When DTH use occurs, or simultaneous use of one DTH with a vibratory hammer or two DTH systems occurs, creating Level B harassment zones that exceed 13 km and 21 km, respectively, and Level A harassment zones that extend over 6 km, one additional PSO will be stationed at the northernmost land-based location at the entrance to Tongass Narrows (at least two PSOs total at that location, four PSOs on duty across all PSO locations). One of these PSO will focus on Tongass Narrows, specifically watching for marine mammals that could approach or enter Tongass Narrows and the project area. The second PSO will look out into Clarence Strait, watching for marine mammals that could swim through the ensonified area. No additional PSOs will be required at the southern-most monitoring location because the Level B harassment zones are truncated to the southeast by islands, which prevent propagation of sound in that direction beyond the confines of Tongass Narrows. Takes by Level B harassment will be recorded by PSOs and extrapolated based upon the number of observed takes and the percentage of the Level B harassment zone that was not visible.

Each construction contractor managing an active construction site and on-going in-water pile installation or removal will provide qualified, independent PSOs for their

specific contract. The ADOT environmental coordinator for the project will implement coordination between or among the PSO contractors. It will be a required component of their contracts that PSOs coordinate, collaborate, and otherwise work together to ensure compliance with project permits and authorizations.

Reporting

A draft marine mammal monitoring report will be submitted to NMFS within 90 days after the completion of pile driving and removal activities, or 60 days prior to a requested date of issuance of any future IHAs for projects at the same location, whichever comes first. The report will include an overall description of work completed, a narrative regarding marine mammal sightings, and associated PSO data sheets. Specifically, the report must include:

- Dates and times (begin and end) of all marine mammal monitoring;
- Construction activities occurring during each daily observation period, including the number and type of piles driven or removed and by what method (*i.e.*, impact, vibratory or DTH) and the total equipment duration for vibratory removal or DTH for each pile or hole or total number of strikes for each pile (impact driving);
- PSO locations during marine mammal monitoring;
- Environmental conditions during monitoring periods (at beginning and end of PSO shift and whenever conditions change significantly), including Beaufort sea state and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon, and estimated observable distance;
- Upon observation of a marine mammal, the following information: Name of PSO who sighted the animal(s) and PSO location and activity at time of sighting; Time of sighting; Identification of the animal(s) (*e.g.*, genus/species, lowest possible taxonomic level, or unidentified), PSO confidence in identification, and the composition of the group if there is a mix of species; Distance and bearing of each marine mammal observed

relative to the pile being driven for each sighting (if pile driving was occurring at time of sighting); Estimated number of animals (min/max/best estimate); Estimated number of animals by cohort (adults, juveniles, neonates, group composition, sex class, etc.); Animal's closest point of approach and estimated time spent within the harassment zone; Description of any marine mammal behavioral observations (*e.g.*, observed behaviors such as feeding or traveling), including an assessment of behavioral responses thought to have resulted from the activity (*e.g.*, no response or changes in behavioral state such as ceasing feeding, changing direction, flushing, or breaching);

- Number of marine mammals detected within the harassment zones and shutdown zones, by species;
- Table summarizing any incidents resulting in take of ESA-listed species;
- Detailed information about any implementation of any mitigation triggered (*e.g.*, shutdowns and delays), a description of specific actions that ensued, and resulting changes in behavior of the animal(s), if any;
- Description of other human activity within each monitoring period;
- Description of any deviation from initial proposal in pile numbers, pile types, average driving times, etc.;
- Brief description of any impediments to obtaining reliable observations during construction period;
- Description of any impediments to complying with these mitigation measures; and
- If visibility degrades to where the PSO(s) cannot view the entire impact or vibratory harassment zones, take of humpback whales will be extrapolated based on the estimated percentage of the monitoring zone that remains visible and the number of marine mammals observed.

If no comments are received from NMFS within 30 days, the draft final report

will constitute the final report. If comments are received, a final report addressing NMFS comments must be submitted within 30 days after receipt of comments.

Reporting Injured or Dead Marine Mammals

In the event that personnel involved in the construction activities discover an injured or dead marine mammal, the IHA-holder must immediately cease the specified activities and report the incident to the Office of Protected Resources (OPR) (*PR.ITP.MonitoringReports@noaa.gov*), NMFS and to the Alaska Regional Stranding Coordinator as soon as feasible. If the death or injury was clearly caused by the specified activity, ADOT must immediately cease the specified activities until NMFS is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the IHA. The IHA-holder must not resume their activities until notified by NMFS. The report must include the following information:

- Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
- Species identification (if known) or description of the animal(s) involved;
- Condition of the animal(s) (including carcass condition if the animal is dead);
- Observed behaviors of the animal(s), if alive;
- If available, photographs or video footage of the animal(s); and
- General circumstances under which the animal was discovered.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects

on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be "taken" through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses (*e.g.*, critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS' implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

To avoid repetition, our analysis applies to all species listed in Table 1 for which take could occur, given that NMFS expects the anticipated effects of the planned pile driving/removal and DTH on different marine mammal stocks to be similar in nature. Where there are meaningful differences between species or stocks, or groups of species, in anticipated individual responses to activities, impact of expected take on the population due to differences in population status, or impacts on habitat, NMFS has identified species-specific factors to inform the analysis.

Pile driving and DTH activities associated with the project, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment and, for some species Level A harassment, from underwater sounds generated by pile driving and DTH. Potential takes could occur if marine mammals are present in zones ensonified above the

thresholds for Level B harassment or Level A harassment, identified above, while activities are underway.

NMFS does not anticipate that serious injury or mortality will occur as a result of ADOT's planned activity given the nature of the activity, even in the absence of required mitigation. Further, no take by Level A harassment is anticipated for Pacific white-sided dolphin, killer whale, or humpback whale, due to the likelihood of occurrence and/or required mitigation measures. As stated in the mitigation section, ADOT will implement shutdown zones that equal or exceed many of the Level A harassment isopleths shown in Table 12. Take by Level A harassment is authorized for some species (Steller sea lions, harbor seals, harbor porpoises, Dall's porpoises, and minke whales) to account for the potential that an animal could enter and remain within the area between a Level A harassment zone and the shutdown zone for a duration long enough to be taken by Level A harassment, and in some cases, to account for the possibility that an animal could enter a shutdown zone without detection given the various obstructions along the shoreline, and remain in the Level A harassment zone for a duration long enough to be taken by Level A harassment before being observed and a shutdown occurring. Any take by Level A harassment is expected to arise from, at most, a small degree of PTS because animals would need to be exposed to higher levels and/or longer duration than are expected to occur here in order to incur any more than a small degree of PTS. Additionally, and as noted previously, some subset of the individuals that are behaviorally harassed could also simultaneously incur some small degree of TTS for a short duration of time. Because of the small degree anticipated, though, any PTS or TTS potentially incurred here is not expected to adversely impact individual fitness, let alone annual rates of recruitment or survival.

For all species and stocks, take will occur within a limited, confined area (adjacent to the project site) of the stock's range. Take by Level A harassment and Level

B harassment will be reduced to the level of least practicable adverse impact through use of mitigation measures described herein. Further the amount of take authorized is small when compared to stock abundance.

Behavioral responses of marine mammals to pile driving, pile removal, and DTH at the sites in Tongass Narrows are expected to be mild, short term, and temporary. Marine mammals within the Level B harassment zones may not show any visual cues they are disturbed by activities or they could become alert, avoid the area, leave the area, or display other mild responses that are not observable such as changes in vocalization patterns. Given that pile driving, pile removal, and DTH will occur for only a portion of the project's duration and often on nonconsecutive days, any harassment will be temporary. Additionally, many of the species present in Tongass Narrows or Clarence Strait will only be present temporarily based on seasonal patterns or during transit between other habitats. These temporarily present species will be exposed to even smaller periods of noise-generating activity, further decreasing the impacts.

For all species except humpback whales, there are no known Biologically Important Areas (BIAs) near the project zone that will be impacted by ADOT's planned activities. For humpback whales, the whole of Southeast Alaska is a seasonal BIA from spring through late fall (Ferguson *et al.* 2015), however, Tongass Narrows and Clarence Strait are not important portions of this habitat due to development and human presence. Tongass Narrows is also a small passageway and represents a very small portion of the total available habitat. Also, while southeast Alaska is considered an important area for feeding humpback whales between March and May (Ellison *et al.* 2012), it is not currently designated as critical habitat for humpback whales (86 FR 21082; April 21, 2021).

More generally, there are no known calving or rookery grounds within the project area, but anecdotal evidence from local experts shows that marine mammals are more

prevalent in Tongass Narrows and Clarence Strait during spring and summer associated with feeding on aggregations of fish, meaning the area may play a role in foraging. Because ADOT's activities could occur during any season, takes may occur during important feeding times. However, the project area represents a small portion of available foraging habitat and impacts on marine mammal feeding for all species, including humpback whales, should be minimal.

Any impacts on marine mammal prey that occur during ADOT's planned activity will have, at most, short-term effects on foraging of individual marine mammals, and likely no effect on the populations of marine mammals as a whole. Indirect effects on marine mammal prey during the construction are expected to be minor, and these effects are unlikely to cause substantial effects on marine mammals at the individual level, with no expected effect on annual rates of recruitment or survival.

In addition, it is unlikely that minor noise effects in a small, localized area of habitat will have any effect on the reproduction or survival of any individuals, much less the stocks' annual rates of recruitment or survival. In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activities will have only minor, short-term effects on individuals. The specified activities are not expected to impact rates of recruitment or survival and will, therefore, not result in population-level impacts.

In summary, and as described above, the following factors primarily support our determination that the impacts resulting from this activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

- No serious injury or mortality is anticipated or authorized;
- Take by Level A harassment of Pacific white-sided dolphin, killer whale, and humpback whale is not anticipated or authorized;

- ADOT will implement mitigation measures including soft-starts for impact pile driving and shutdown zones to minimize the numbers of marine mammals exposed to injurious levels of sound, and to ensure that any take by Level A harassment is, at most, a small degree of PTS;
- The intensity of anticipated takes by Level B harassment is relatively low for all stocks and will not be of a duration or intensity expected to result in impacts on reproduction or survival;
- The only known area of specific biological importance covers a broad area of southeast Alaska for humpback whales, and the project area is a very small portion of that BIA. No other known areas of particular biological importance to any of the affected species or stocks are impacted by the activity, including ESA-designated critical habitat;
- The project area represents a very small portion of the available foraging area for all potentially impacted marine mammal species and stocks and anticipated habitat impacts are minor; and
- Monitoring reports from similar work in Tongass Narrows have documented little to no effect on individuals of the same species impacted by the specified activities.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the required monitoring and mitigation measures, NMFS finds that the total marine mammal take from the planned activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where

estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. When the predicted number of individuals to be taken is fewer than one third of the species or stock abundance, the take is considered to be of small numbers. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

The instances of take NMFS authorized are below one third of the estimated stock abundance for all stocks (see Table 14). The number of animals that we expect to authorize to be taken from these stocks is considered small relative to the relevant stocks' abundances even if each estimated taking occurred to a new individual, which is an unlikely scenario. Some individuals may return multiple times in a day, but PSOs will count them as separate takes if they cannot be individually identified.

The Alaska stock of Dall's porpoise has no official NMFS abundance estimate for this area, as the most recent estimate is greater than eight years old. The most recent estimate was 13,110 animals for just a portion of the stock's range. Therefore, the 227 authorized takes of this stock clearly represent small numbers of this stock.

Likewise, the Southeast Alaska stock of harbor porpoise has no official NMFS abundance estimate as the most recent estimate is greater than 8 years old. The most recent estimate was 11,146 animals (Muto *et al.* 2021) and it is highly unlikely this number has drastically declined. Therefore, the 32 authorized takes of this stock clearly represent small numbers of this stock.

There is no current or historical estimate of the Alaska minke whale stock, but there are known to be over 1,000 minke whales in the Gulf of Alaska (Muto *et al.* 2018), so the 3 authorized takes clearly represent small numbers of this stock. Additionally, the range of the Alaska stock of minke whales is extensive, stretching from the Canadian

Pacific coast to the Chukchi Sea, and ADOT's project area impacts a small portion of this range.

Based on the analysis contained herein of the planned activity (including the required mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

In order to issue an IHA, NMFS must find that the specified activity will not have an "unmitigable adverse impact" on the subsistence uses of the affected marine mammal species or stocks by Alaska Natives. NMFS has defined "unmitigable adverse impact" in 50 CFR 216.103 as an impact resulting from the specified activity: (1) That is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by: (i) Causing the marine mammals to abandon or avoid hunting areas; (ii) Directly displacing subsistence users; or (iii) Placing physical barriers between the marine mammals and the subsistence hunters; and (2) That cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

Harbor seals are the marine mammal species most regularly harvested for subsistence by households in Ketchikan and Saxman (a community a few miles south of Ketchikan, on the Tongass Narrows). Eighty harbor seals were harvested by Ketchikan residents in 2007, which ranked fourth among all communities in Alaska that year for harvest of harbor seals. Thirteen harbor seals were harvested by Saxman residents in 2007. In 2008, two Steller sea lions were harvested by Ketchikan-based subsistence hunters, but this is the only record of sea lion harvest by residents of either Ketchikan or Saxman. In 2012, the community of Ketchikan had an estimated subsistence take of 22 harbor seals and 0 Steller sea lion (Wolf *et al.* 2013). NMFS is not aware of more recent

data. Hunting usually occurs in October and November (ADF&G 2009), but there are also records of relatively high harvest in May (Wolfe *et al.* 2013). The Alaska Department of Fish and Game (ADF&G) has not recorded harvest of cetaceans from Ketchikan or Saxman (ADF&G 2018).

All project activities will take place within the industrial area of Tongass Narrows immediately adjacent to Ketchikan where subsistence activities do not generally occur. Both the harbor seal and the Steller sea lion may be temporarily displaced from the project area. The project will also not have an adverse impact on the availability of marine mammals for subsistence use at locations farther away, where these construction activities are not expected to take place. Some minor, short-term harassment of the harbor seals could occur, but given the information above, we do not expect such harassment to have effects on subsistence hunting activities.

Based on the description of the specified activity and the required mitigation and monitoring measures, NMFS has determined that there will not be an unmitigable adverse impact on subsistence uses from ADOT's planned activities.

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq*.) and NOAA Administrative Order (NAO) 216-6A, NMFS must evaluate our proposed action (*i.e.*, the issuance of an IHA) and alternatives with respect to potential impacts on the human environment. This action is consistent with categories of activities identified in Categorical Exclusion B4 of the Companion Manual for NAO 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has determined that this action qualifies to be categorically excluded from further NEPA review.

Endangered Species Act

Section 7(a)(2) of the Endangered Species Act of 1973 (ESA: 16 U.S.C. 1531 *et seq*.) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of IHAs, NMFS' Office of Protected Resources (OPR) consults internally whenever we propose to authorize take for endangered or threatened species, in this case with NMFS' Alaska Regional Office (AKRO).

NMFS OPR is proposing to authorize take of the Central North Pacific stock of humpback whales, of which a portion belong to the Mexico DPS of humpback whales, which are ESA-listed. On February 6, 2019, NMFS AKRO completed consultation with NMFS for the Tongass Narrows Project and issued a Biological Opinion. Reinitiation of formal consultation was required to analyze changes to the action that were not considered in the February 2019 opinion (PCTS# AKR-2018-9806/ECO# AKRO-2018-01287). The original opinion considered the effects of only one project component being constructed at a time and did not analyze potential effects of concurrent pile driving that may cause effects to the listed species that were not considered in the original opinion; therefore, reinitiation of formal consultation was required. NMFS' AKRO issued a revised Biological Opinion to NMFS' OPR on December 19, 2019 that concluded that issuance of IHAs to ADOT is not likely to jeopardize the continued existence of Mexico DPS humpback whales. The effects of this Federal action were adequately analyzed in NMFS' *Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion for Construction of the Tongass Narrows Project (Gravina Access)*, revised December 19, 2019, which concluded that the take NMFS proposes to authorize through this IHA would not jeopardize the continued existence of any endangered or threatened species or

destroy or adversely modify any designated critical habitat. NMFS has determined that issuance of this IHA does not require reinitiation of the December 2019 Biological Opinion.

Authorization

NMFS has issued an IHA to ADOT for the potential harassment of small numbers of eight marine mammal species incidental to construction of four facilities in the channel between Gravina Island and Revillagigedo (Revilla) Island in Ketchikan, Alaska, that includes the previously explained mitigation, monitoring and reporting requirements.

Dated: March 11, 2022.

Kimberly Damon-Randall,

Director, Office of Protected Resources,

National Marine Fisheries Service.

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